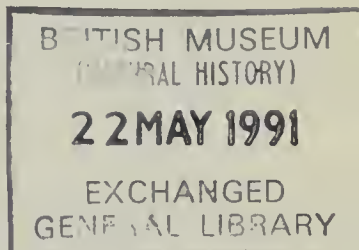


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The *Amaurobiidae* of Northern Italy (Araneae)

Riassunto — Nella parte generale del lavoro le specie dell'Italia settentrionale della famiglia *Amaurobiidae* vengono prese in considerazione sotto il profilo sistematico, con particolare riguardo alla struttura degli organi copulatori dei due sessi, che vengono raffigurati per tutte le specie esaminate. Nella parte speciale vengono forniti dati geonemici inediti, e vengono descritte due nuove specie: *Amaurobius sciakyi*, delle Alpi Lombarde orientali e Venete occidentali, affine ad *A. obustus* e con alcune caratteristiche intermedie fra quelle del gruppo di *A. fenestralis*, cui appartiene, e quelle del gruppo di *A. ferox*, e *A. pavesii*, delle Alpi Apuane e dell'Emilia occidentale, appartenente al gruppo di *A. ferox* e particolarmente affine ad *A. scopoli*. Viene infine stabilita la sinonimia fra *A. tessinensis* Dresco, 1977 e *A. crassipalpis* Canestrini & Pavesi, 1870, di cui viene designato il neotipo.

Abstract — The general part of this work deals with the taxonomy of North-Italian species of Amaurobiid-spiders, with particular regard to the structure of copulatory organs of both sexes, which are illustrated for all examined species. In the special part are given new distributional data, and are described two new species: *Amaurobius sciakyi*, from eastern Lombard and western Venetian Alps, related to *A. obustus* and somewhat intermediate between the groups of *A. fenestralis* (to which it belongs) and *A. ferox*, and *A. pavesii* from Alpi Apuane (northern Tuscany) and western Emily, belonging to the group of *A. ferox* and closely related to *A. scopoli*. The synonymy between *A. tessinensis* Dresco, 1977 and *A. crassipalpis* Canestrini & Pavesi, 1870, with designation of the neotypus of the latter, is finally established.

Key words: *Amaurobiidae*, Italy.

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The study of a rich material from Northern Italy, mainly belonging to the collections of Milan and Bergamo Natural History Museums, brought me to discover two new species of *Amaurobiidae*, and to achieve a large amount of new distributional data concerning the already known ones. Even if some excellent works have been published in a recent past, I preferred not to restrict my work to the description of the new species and to the publication of the new records, but also to widen it with the illustration of all the species I have personally ascertained for Northern Italy and with taxonomic considerations based mainly upon the analysis of the structure of copulatory organs in both sexes.

General part

As Lethinen (1967) pointed out, in Europe the Family *Amaurobiidae* must be restricted to the ancient genus *Amaurobius* Koch, i.e. to the true *Amaurobius* and to *Callobius* Chamberlin, an essentially nearctic genus represented in Europe by the only *C. claustrarius* (Hahn). In his fundamental work Lethinen considers the taxonomy of both genera, but his analysis is rather superficial, because of the huge extensiveness of the task he undertook, the taxonomic revision of all cribellate spiders and related groups of the world.

The following considerations on the comparative structure of copulatory organs, even though I examined only the North-Italian species, aim at providing a contribution to a further, wider taxonomic analysis of the family. *The male palp* - Excellent diagnostic characters are offered by the structure of the tibia, which always bears an ectolateral apophysis (here called lateral) and one (dorsal) or two (centrodorsal and laterodorsal) dorsal ones. Different dispositions can be found in *Callobius* and in two separate species-groups of *Amaurobius*. In *Callobius* the lateral apophysis is pointed and bent upwards, the centrodorsal is short and simply pointed and the laterodorsal is very long and slender. Both groups of *Amaurobius* have on the contrary an obtusely lobed and forward directed lateral apophysis; one of them, that can be called *fenestralis*-group and that includes all the species of the I group proposed by Lethinen together with *A. obustus* Koch and *A. sciakyi* n. sp., has two dorsal apophyses, the centrodorsal shorter, simple or toothed, the laterodorsal longer and always simple. The second one (*ferox*-group), corresponding to the II group of Lethinen, has only a dorsal apophysis, with inner margin thickened or produced into a blunt protuberance. The same subdivision is suggested also by the structure of the bulbus, and particularly by the shape of its tegular apophysis. The latter is formed by a short rounded protuberance (*Callobius*), or is relatively long (*Amaurobius*), with simple (*ferox*-group) or more or less bipid apex (*fenestralis*-group). This character is well defined in *A. obustus*, *A. sciakyi* and *A. fenestralis*, where the apex of the tegular apophysis shows two evident angular projections, while it is less distinct in *A. erberi*, where the outer edge is flattened and the inner one is reduced to a small tooth. Shape and position of embolus and median apophysis offer excellent characters, that are nevertheless useful rather at specific than at higher level.

Epigyne and vulva - Epigyne and vulva are formed by an external plate and, according to the terms used by Lethinen (1967, table 22 p. 240) by a pair of lateral teeth, an epigynal plate and a pair of receptacula. A further distinc-

tion can be made in the structure of epigynal plate, where an outer surface, an inner surface and a posterior transverse bar can be distinguished. The structure of epigyne and vulva is strongly differentiated in *Callobius*: external plate and lateral teeth are clearly separated, the latter forming large and subglobular lobes surrounding most of the reduced receptacula. The epigynal plate is strongly restricted, and its posterior transverse bar is completely divided in the middle. In all *Amaurobius* species external plate and lateral teeth are fused together or indistinctly separated, and the epigynal plate is much wider. In all the species belonging to the *ferox*-group external plate and lateral teeth are completely fused, while in *A. fenestralis* and *A. erberi* they are more or less separated: in the former they really look like little teeth, while in the latter they consist in a scarcely developed fold of the posterior lobes of the external plate. In all the species belonging to the *ferox*-group the posterior transverse bar is entire and well developed, while it lacks completely in the species of the *fenestralis*-group. The inner surface of the epigynal plate, always present in the *ferox*-group, is well developed in *A. obustus* and *A. sciakyi*, partially reduced in *A. erberi* and almost totally absent in *A. fenestralis*.

The two groups of *Amaurobius*-species, according to the characters observed both in the male palp (tibial apophyses and tegular apophysis) and in the epigyne-vulva include in the fauna of Northern Italy the following species:

ferox-group: *A. crassipalpis* Canestrini & Pavesi, *A. jugorum* Koch, *A. ferox* (Walck.), *A. scopolii* Thor. and *A. pavesii* n. sp. (the latter being known only on ♀♀);

fenestralis-group: *A. sciakyi* n. sp., *A. obustus* Koch, *A. erberi* (Keyserl.), *A. similis* (Bl.), *A. fenestralis* (Ström).

The differences between the two groups could justify the institution of two subgenera; I have however preferred to avoid it, in absence of a complete study of all *Amaurobius*-species.

Special part

The single North-Italian species are here listed in systematical order. The symbols used to indicate the geographic provinces are the following (in alphabetical order): BG Bergamo; BL Belluno; BS Brescia; BZ Bolzano; CN Cuneo; CO Como; IM Imperia; MS Massa; NO Novara; PC Piacenza; PR Parma; PV Pavia; SO Sondrio; SV Savona; TN Trento; TO Torino; TV Treviso; UD Udine; VA Varese; VC Vercelli; VI Vicenza; VR Verona.

Callobius claustrarius (Hahn, 1831)

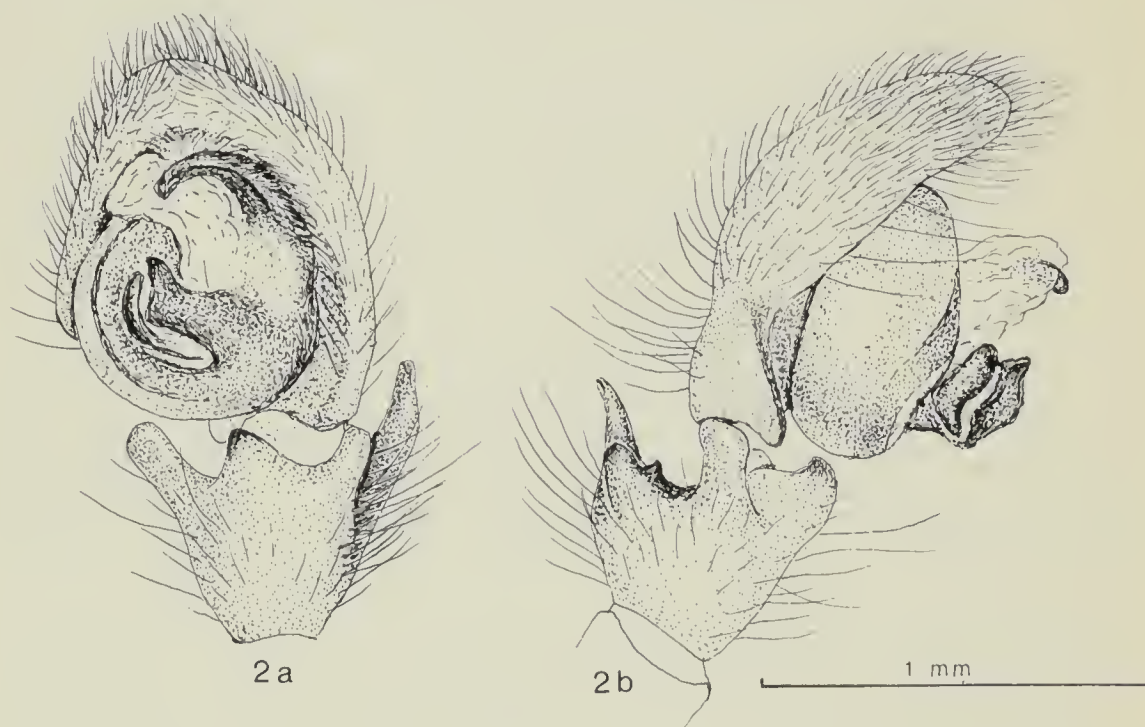
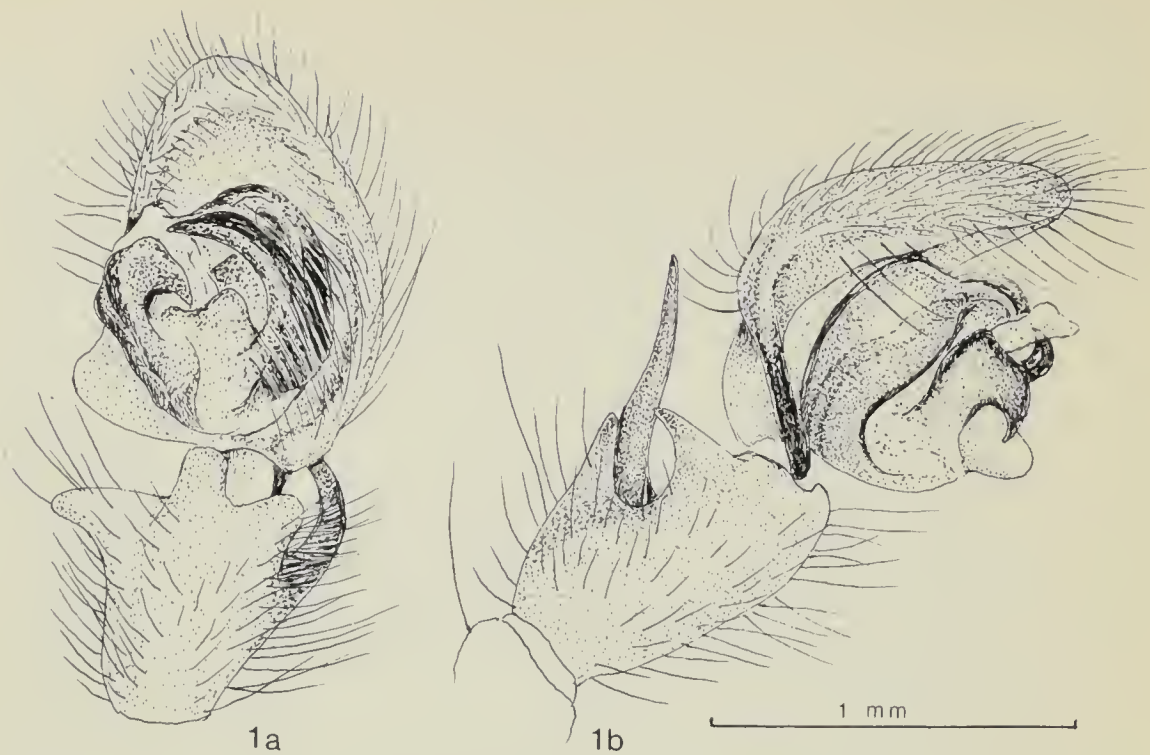
It is the only palearctic species of the genus. It has already been recorded from most Alpine regions of Northern Italy and from Tuscany.

Examined material: Lombardy: Schilpario (BG), Bagni Val Masino (SO), Vione (BS); Trentino-Alto Adige: Valdaora (BZ), Valdaora di Mezzo (BZ), Gais (BZ), Marebbe (BZ).

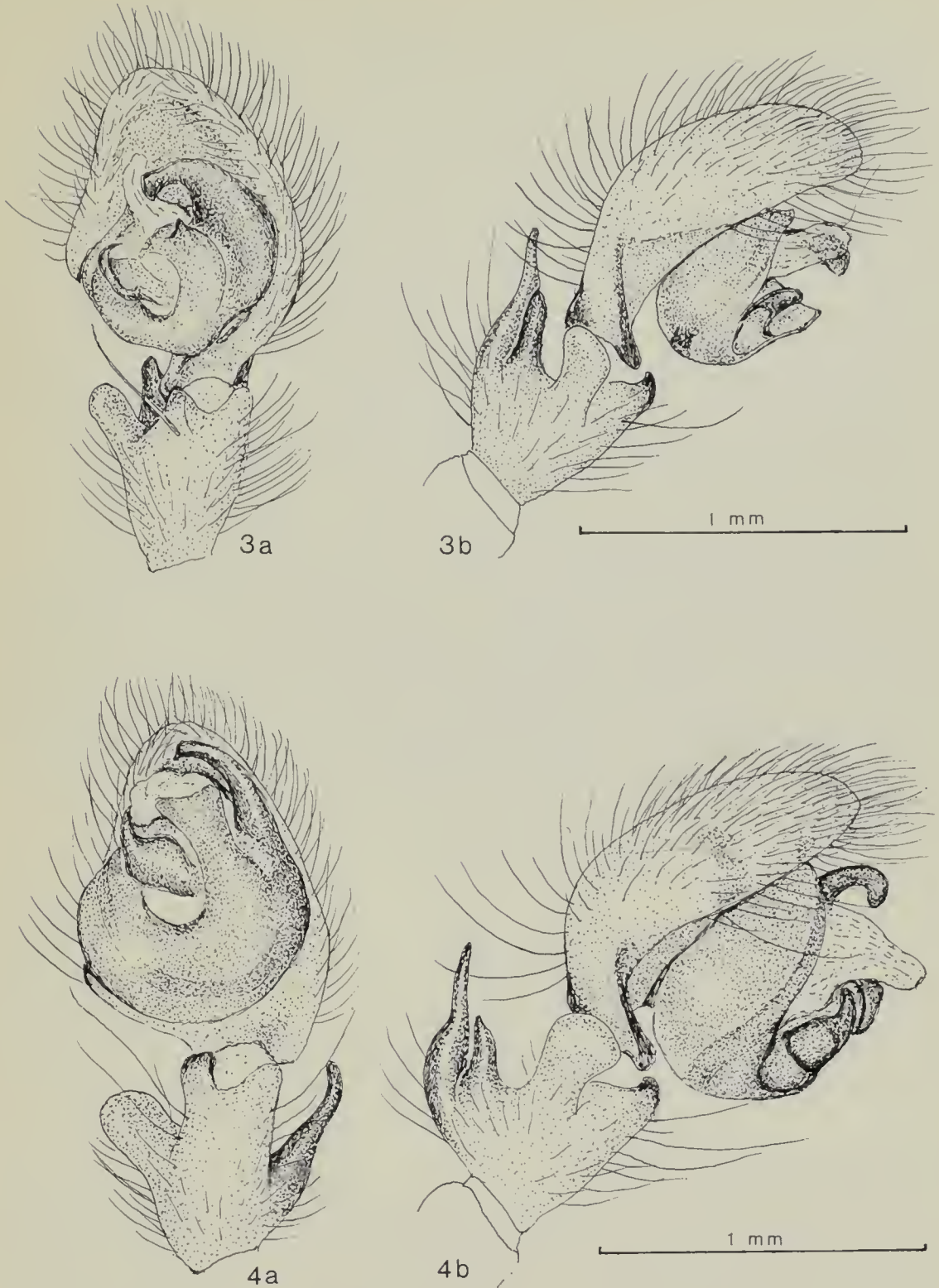
Amaurobius fenestralis (Ström, 1768)

= *Amaurobius occidentalis* Denis, 1963 nec Simon, 1862

It is the type species of both genera *Amaurobius* Koch, 1837, and *Ciniflo* Blackwall, 1841. In spite of that, it can be considered an «extreme» rather than a «typical» species. Some highly distinctive features of the genus, such as the



Figs. 1-2 — ♂ pedipalp in ventral (a) and ectolateral view (b) of: 1 - *Callobius claustrarius* from Bagni Val Masino (SO); 2 - *Amaurobius fenestralis* from Piazzatorre (BG).



Figs. 3-4 — ♂ pedipalp in ventral (a) and ectolateral view (b) of: 3 - *Amaurobius erberi* from Parma; 4 - *Amaurobius obustus* from Miane (TV).

strong median apophysis of the ♂ palp, or the epigynal plate are here less developed than in any other species. The median apophysis is reduced to a very thin lamella, and the epigynal plate lacks both its posterior transverse bar and an inner sclerified surface. The species is recorded from almost all regions of Italy, and is locally rather common. In Northern Italy it can be found above all at mid altitudes. Furthermore, I am nearly sure that the epigyne of a specimen from Passo Cereda (Dolomites) illustrated by Denis (1963) and referred by him to *A. occidentalis* Simon should be referred to this species, mainly because of the occurrence of two small pointed teeth by the sides of the epigynal plate and the dark pattern due to the position of the receptacula, features which are both incompatible with the epigyne of the true *A. occidentalis* Sim., while they fit *A. fenestralis* much better.

Examined material: Piedmont: Macugnaga (NO); Lombardy: Gorno (BG), Piazzatorre (BG), Oltressenda Alta (BG), Valbondione (BG), Torre de Busi (BG), Roncobello (BG), Rovetta (BG), Vione (BS), Saviore dell'Adamello (BS), Val Masino (SO); Trentino-Alto Adige: Pejo (TN).

Amaurobius similis (Blackwall, 1845)

This species has been recorded by Di Caporiacco (1922, 1923, 1927) from Lombardy, Carnia and Tuscany (Florence). I have never seen Italian specimens of *A. similis*; as far as the records from Carnia are concerned, it must be noted that Di Caporiacco does not mention in his works *A. obustus* Koch, probably the commonest species in that region, that before its redescription by Wiehle (1953) was often misidentified or ignored by several authors, and to which are perhaps to be referred these records. However, the occurrence of *A. similis* in Northern Italy is possible, also in view of its wide diffusion in the neighbouring areas.

Good illustrations of the genitalia of the species are given by Wiehle (1953) and Roberts (1985).

Amaurobius erberi (Keyserling, 1863)

Widespread all over the Italian Peninsula, in Northern Italy this species occurs on the plain or at low altitudes.

Examined material: Emily: Parma, Ferrara; Liguria: Ventimiglia (IM); Lombardy: Milano, Cernusco Montevicchia (CO).

Amaurobius obustus Koch, 1868

This species has been recorded for Italy only by Denis (1963) and Hubert (1965), in both cases from the province of Belluno (BL). Its distribution in Northern Italy is wider, even if probably limited to the Eastern Alps, where it is locally abundant at middle and high altitudes. The lack of older records should likely be attributed to misidentification due to the poor quality of the iconography available before the redescription of the species by Wiehle (1953).

Examined material: Trentino-Alto Adige: Valdaora (BZ); Veneto: Bassano (VI), Miane (TV), Vittorio Veneto (TV), Grotta dell'Orso (TV), M. Cesen (TV), Bosco del Cansiglio (BL); Friuli-Venezia Giulia: Ovaro (UD), P.so M. Croce Carnico (UD), Arta Terme (UD), Forni di Sopra (UD).

Amaurobius sciakyi nov. sp.

Carapace yellowish brown with faint radiating striae; anterior median eyes distinctly smaller than posterior medians. Chelicerae deep brown, swollen in front. Labium and maxillae yellowish brown, whitish at tip. Sternum yellow-brown, slightly darkened at the edges. ♀ palps yellowish with deep brown tarsi. Femur and patella of ♂ palp pale yellowish, tibia a little darker with dorsal apophyses deep brown, the centrodorsal simple, relatively short and pointed, the laterodorsal long, narrow and arched. Tegular apophysis of bulb with two apical protuberances, the inner pointed, the outer broadly truncated. For other features of ♂ palp, see figs. 10a and 10b. Legs yellowish with faint annulations on tibiae and underside of femora. Abdomen generally with a blackish median longitudinal stripe in the anterior half. Outer surface of epigynal plate subtrapezoidal with rounded angles, inner surface well developed, posterior transverse bar absent. For other features of epigyne and vulva, see figs. 9a and 9b.

Holotype ♂: Pezzoro (Lombardy, province of Bergamo), 23.IV.1988, lg. R. Sciaky, preserved in the collection of the Museo Civico di Storia Naturale, Milano (cat. MSNM Ar 3054).

Paratypes: Spluga della Preta (Veneto, province of Verona), lg. D. Zanon, 19.V.1990, 2 ♂♂ (cat. MSNM AR 3173), 3 ♀♀ (cat. MSNM AR 3174); Id. 18.II.1989, 2 ♀♀ (cat. MSNM Ar 3175); id. 24.II.1990, 2 ♀♀ (cat. MSNM AR 3176); 1 ♀ M. Pizzocolo (Lombardy, province of Brescia), 7.V.1983, lg. M. Pavesi (cat. MSNM Ar 3050) and 1 ♀ Grotta dei Prusti near Giazza (Veneto, province of Verona), 25.III.1982, lg. R. Sciaky (cat. MSNM Ar 3049), all preserved in the collection of the Museo Civico di Storia Naturale, Milan.

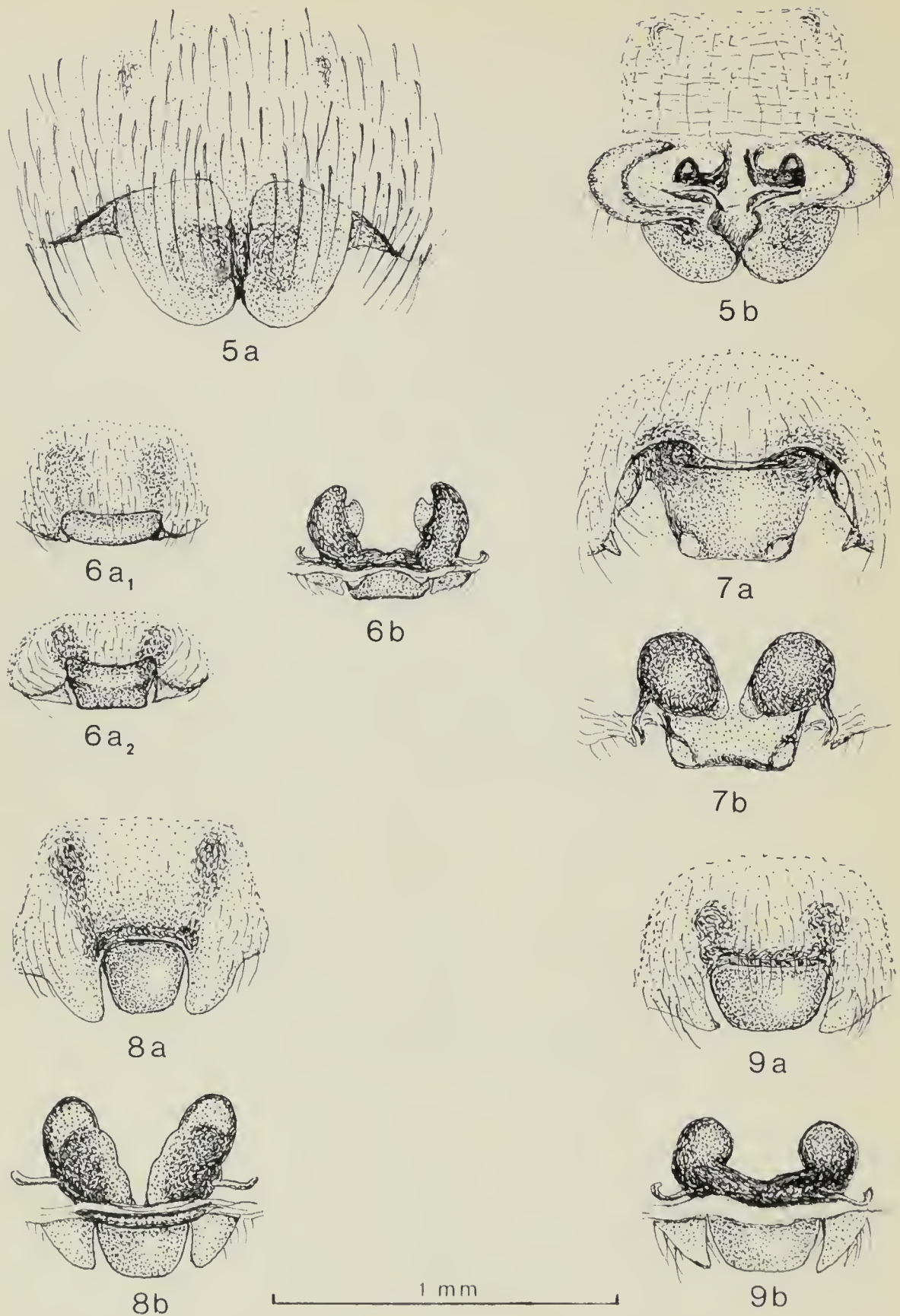
Measurements (Holotype ♂, mm): Carapace 2,8 long, 2,0 wide, abdomen 2,6 long, 1,9 wide, legs as follows:

	I	II	III	IV
femur	3,1	2,5	2,1	2,5
patella	1,0	1,0	0,8	0,9
tibia	3,1	2,2	1,7	2,2
metatarsus	3,0	2,1	1,6	2,1
tarsus	1,5	1,1	0,9	1,0

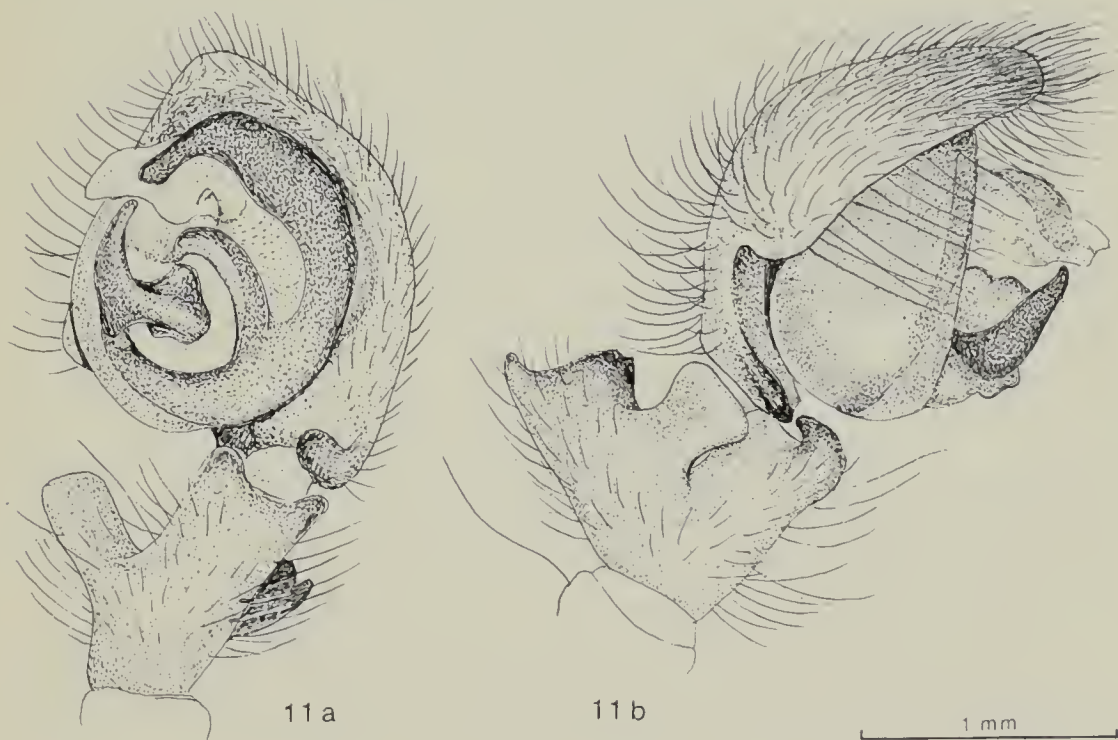
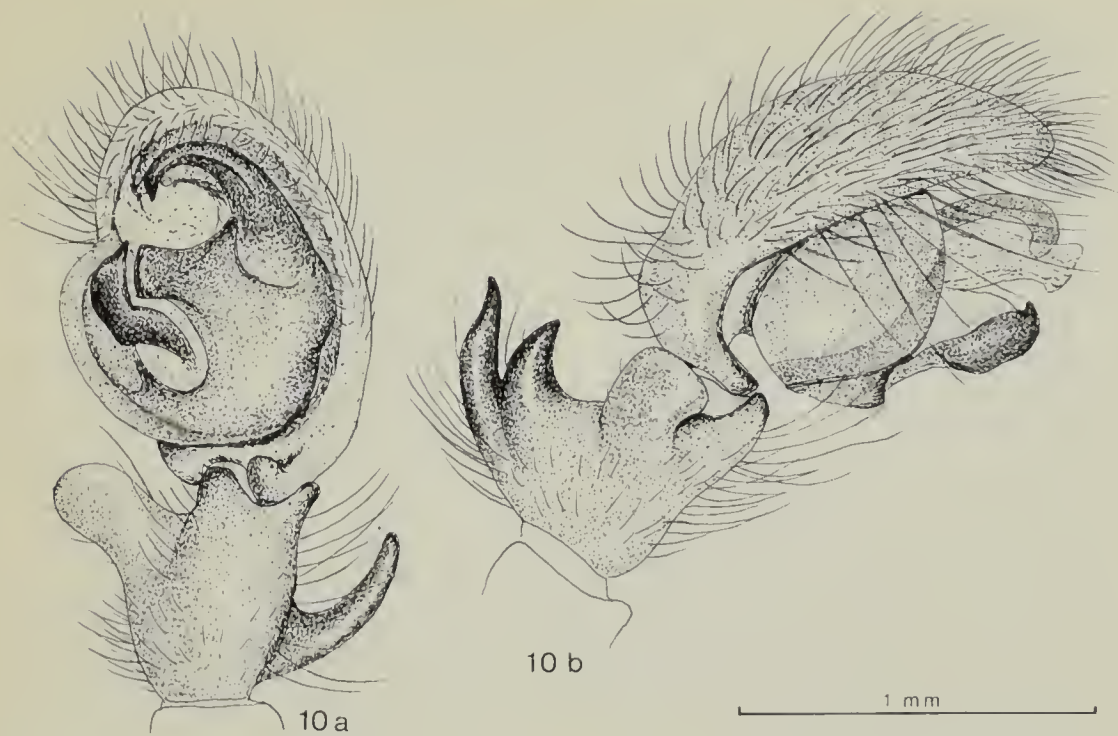
Measurements (Paratype ♀ from Mt. Pizzocolo, mm): Carapace 3,2 long, 2,3 wide, abdomen 5,4 long, 3,7 wide, legs as follows:

	I	II	III	IV
femur	2,5	2,3	2,0	2,4
patella	1,0	0,9	0,8	1,0
tibia	2,2	1,9	1,5	2,0
metatarsus	2,0	1,7	1,4	1,9
tarsus	1,2	0,9	0,9	1,0

The new species belongs to the *fenestralis*-group, but is less differentiated than the others from the species of the *ferox*-group, because of the structure of the tibial apophyses and the bulb of the ♂ palp, as well as the conformation of epigynal plate and receptacula.



Figs. 5-9 — Epigyne in dorsal (a, a₁) and postero-dorsal view (a₂), vulva in dorsal view (b) of: 5 - *Callobius claustrarius* from Bagni Val Masino (SO); 6 - *Amaurobius erberi* from Ferrara; 7 - *Amaurobius fenestralis* from Gorno (BG); 8 - *Amaurobius obustus* from Miane (TV); 9 - *Amaurobius sciakyi* from M. Pizzocolo (BS), Paratypus.



Figs. 10-11 - ♂ pedipalp in ventral (a) and ectolateral view (b) of: 10 - *Amaurobius sciakyi* from Pezzoro (BG), Holotypus; 11 - *Amaurobius jugorum* from Ponte Florio (VR).

Amaurobis crassipalpis Canestrini & Pavesi 1870
 = *Amaurobius tessinensis* Dresco, 1977, syn. nov.

In a recent work (1977) Dresco described *A. tessinensis*, a new species of *Amaurobius* from Canton Ticino in Switzerland, and at the same time he undertook a meticulous analysis of the synonymy of *A. crassipalpis* Canestrini & Pavesi, unfortunately based only on literature. The arguments produced in support of the synonymy between *A. crassipalpis* and *A. jugorum* are far from being persuasive; on the contrary, the opinion of L. Koch and the descriptions by Simon and Canestrini & Pavesi, quoted by the Author, seem to indicate that *A. crassipalpis* is rather a valid species than a synonym of *A. jugorum* Koch, as Dresco showed to believe when he wrote (l.c., p. 877): «La synonymie de *crassipalpis* avec *jugorum* étant ainsi nettement confirmée».

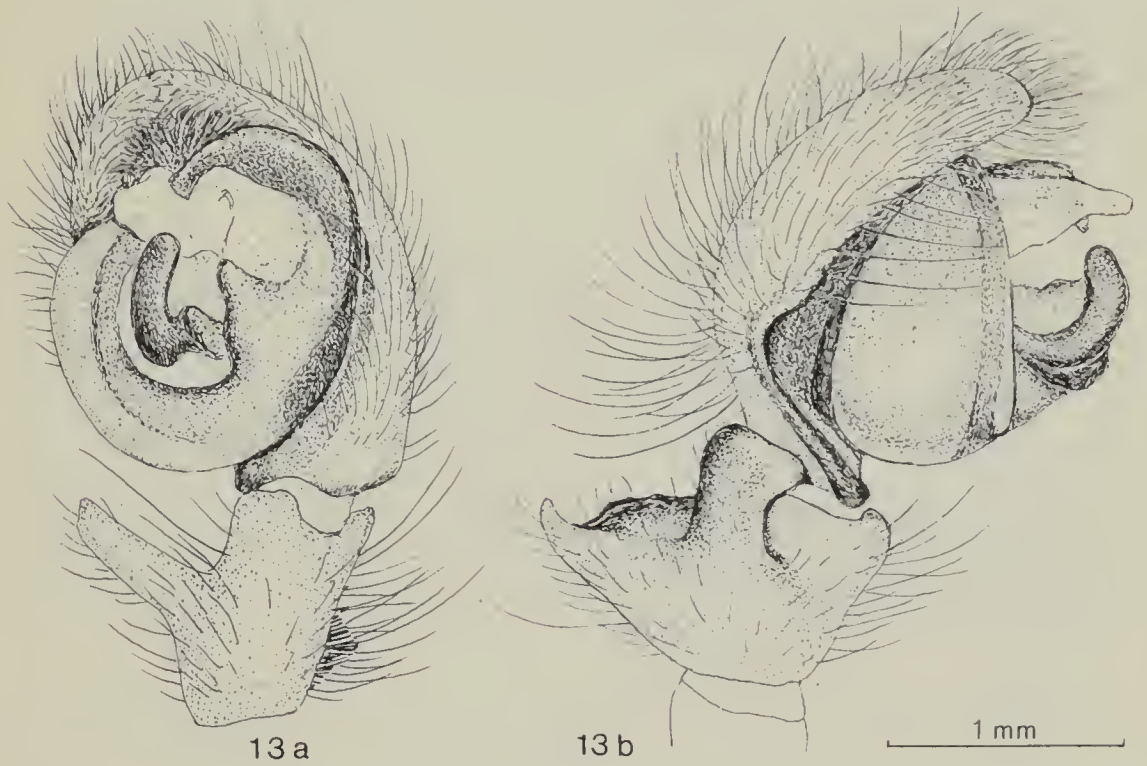
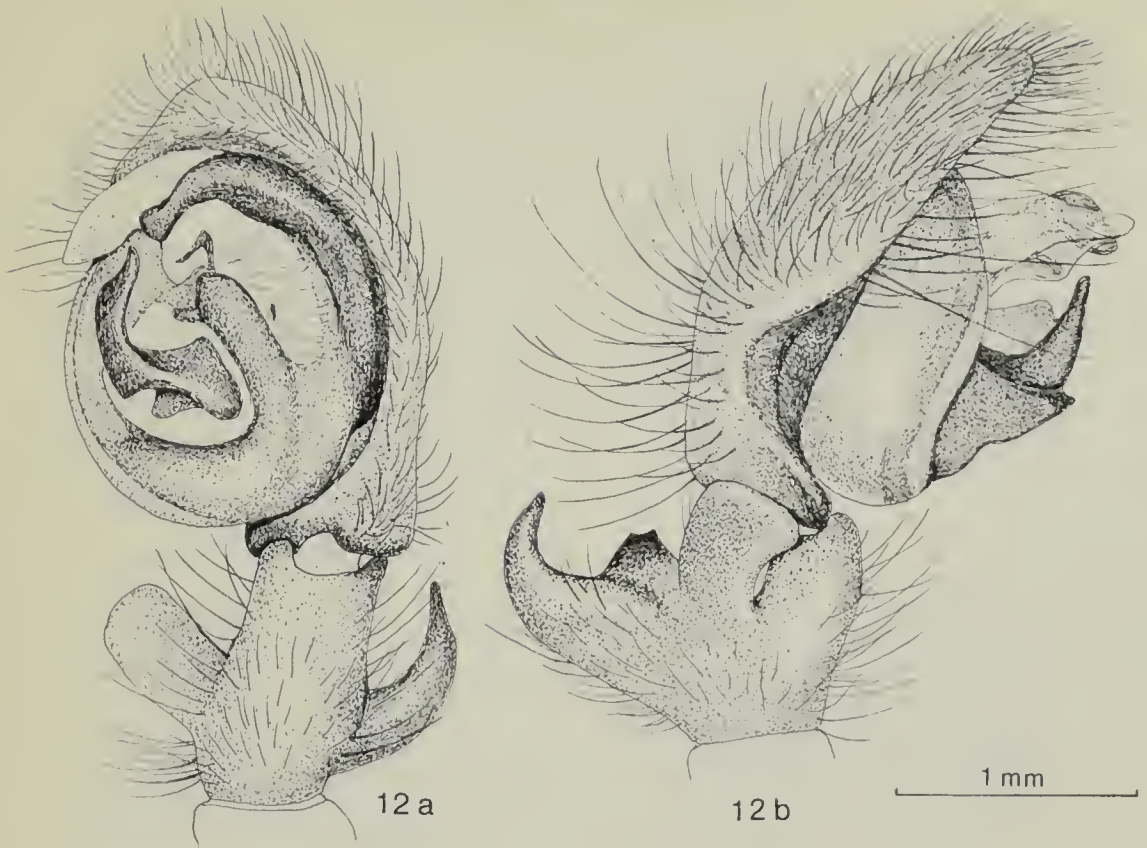
Thanks to the kindness of Dr. Roberto Poggi and Mr. Giuliano Doria (Genoa Museum of Natural History), I had the chance to examine 2 ♂♂ and 1 ♀ of *A. crassipalpis* determined by Pavesi (M. San Salvatore in Canton Ticino) and preserved in their Institute. They are the specimens quoted by Pavesi, 1875, on occasion of the description of the ♀ of the species. As the original types are to be considered lost (see Brignoli, 1983) I designate as Neotype, according to the article 75 (a, b and d) of the International Code, one of the topotypical ♂ from M. Salvatore, which is labelled «*Amaurobius crassipalpis* Can. & Pav., *Neotypus* ♂, C. Pesarini des. 1990» and preserved in the collection of the Museo Civico di Storia Naturale G. Doria, Genoa.

The species is well characterized through the dorsal apophysis of the ♂ palpal tibia, which is strongly produced and curved, and bears a basal tooth that is simply truncated at apex. Also all the other features of the palp correspond perfectly to the drawings given by Dresco for *A. tessinensis*, and to what I observed in many specimens from Lombardy that are to be attributed to this species, that must therefore be named *A. crassipalpis*.

As already underlined by Dresco (sub *A. tessinensis*) *A. crassipalpis* is closely related to *A. jugorum*, from which the ♂ can be easily distinguished through the longer and strongly curved dorsal apophysis of the palpal tibia. In the ♀, the receptacula are much less approached each other than in *A. jugorum*, what produces a different dark pattern that can be observed also in the epigyne (see figs. 15-17).

A. crassipalpis was described from Canton Ticino and Trentino, without more detailed indications; as *A. tessinensis* Dresco it has been recently recorded also for Lombardy, Rif. Tedeschi (CO) by Maurer & Hänggi (1989). I could ascertain that, as a matter of fact, *A. crassipalpis* is the commonest *Amaurobius*-species in the Lombard Alps, mainly at mid altitudes.

Examined material: Lombardy: Rif. Tedeschi (CO), Pasturo (CO), Brumate (CO), Alpe del Vicerè (CO), Imbersago (CO), Bergamo, Brembilla (BG), Ambivere (BG), S. Vigilio (BG), Colle Aperto (BG), Gorno (BG), Gromo (BG), Entratico (BG), Oltre il Colle (BG), Paderno d'Adda (BG), Paitone (BG), Laca di Tombe (BG), Val Secca (BG), Roncobello (BG), Valbondione (BG), Torre de Busi (BG), Tavernola (BG), Sedrina (BG), Schilpario (BG), Rovato (BS), Ponte Savio (BS), Gardone Riviera (BS), Montorfano (BS), Val Masino (SO).



Figs. 12-13 — ♂ pedipalp in ventral (a) and ectolateral view (b) of: 12 - *Amaurobius crassipalpis* from Laca di Tombe (BG); 13 - *Amaurobius ferox* from Somma Lombardo (VA).

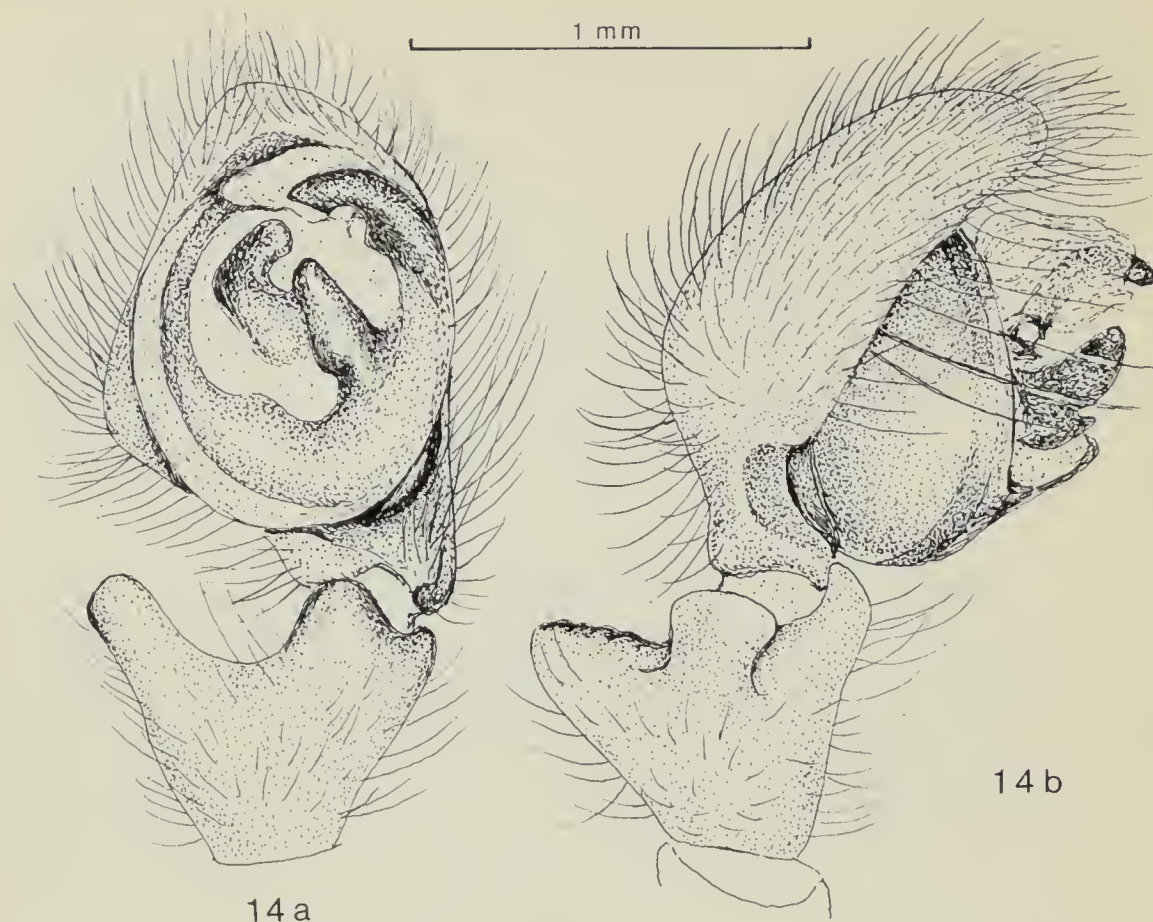


Fig. 14 — ♂ pedipalp in ventral (a) and ectolateral view (b) of *Amaurobius scopolii* from Badagnano (PC).

Amaurobius jugorum Koch, 1868

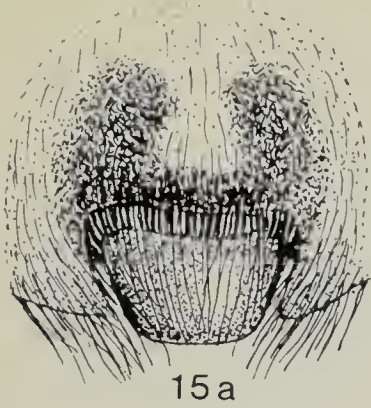
This species was up to now known for Italy only from single localities of Liguria, Lombardy, Veneto, Friuli-Venezia Giulia and Emily. It is widely diffused in Northern Italy, and rather common in Piedmont; it is present also in the Orobian Alps, even if much rarer there than *A. crassipalpis*.

Examined material: Piedmont: S. Giacomo (TO), Roncasso (TO), Locana (TO), Rosazza (VC), Premeno (NO), Arona (NO), Bèe (NO); Lombardy: M. Piambello (VA), Roncobello (BG); Trentino-Alto Adige: Levico (TN), Pietramurata (TN); Veneto: Ponte Florio (VR); Grezzana (VR), Malcesine (VR), Bassano (VI), Asolo (TV), Miane (TV); Friuli-Venezia Giulia: Arta Terme (UD), Chiusaforte (UD); Emily: Vigheffio (PR).

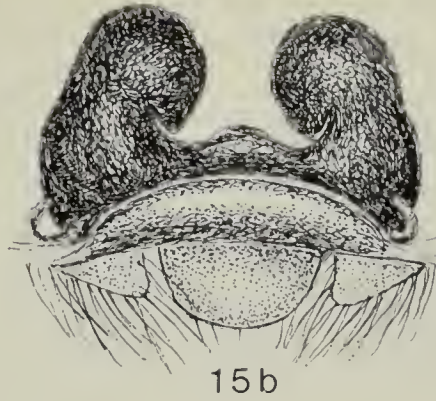
Amaurobius ferox (Walckenaer, 1830)

Widespread species, already known from most regions of Italy. It lives above all on plain and at mid altitudes.

Examined material: Piedmont: Almese (TO); Lombardy: Somma Lombardo (VA), Cava di Ganna (VA), Milano, Cernusco Montevicchia (CO), Bergamo, S. Agostino (BG), Gorno (BG), Rota Imagna (BG), S. Omobono (BG); Montalto Pavese (PV), Val Masino (SO).



15a



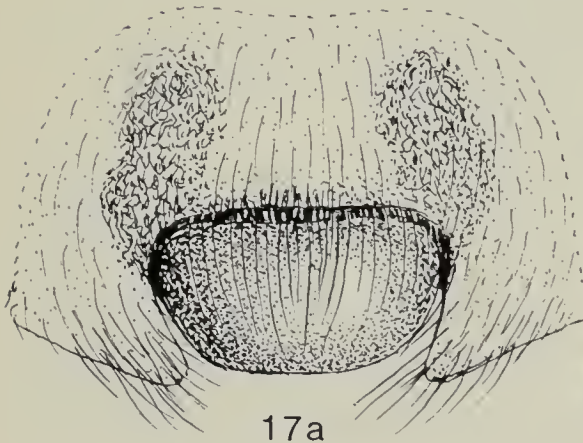
15b



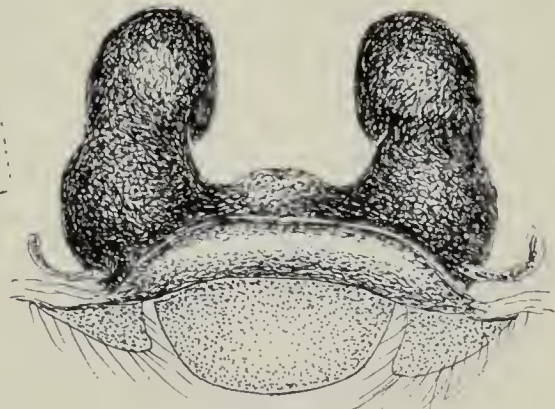
16a



16b



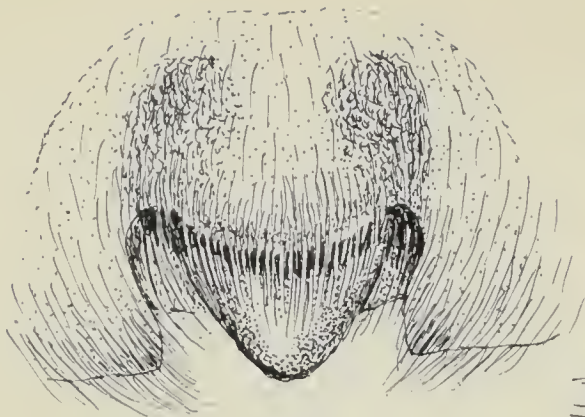
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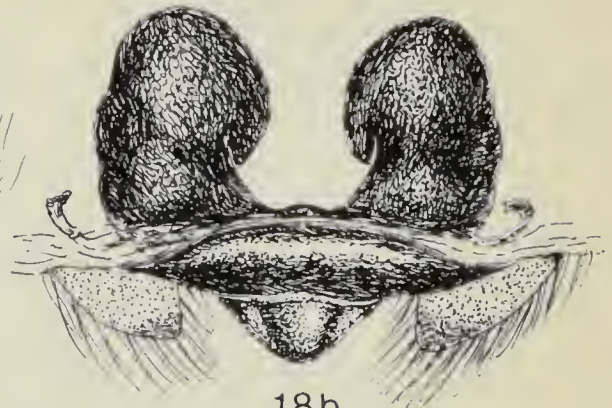
17b

1 mm

Figs. 15-17 - Epigyne in ventral (a) and vulva in dorsal view (b) of: 15 - *Amaurobius jugorum* from Premeno (NO); 16 - *Amaurobius jugorum* from Ponte Florio (BS); 17 - *Amaurobius crasipalpis* from Gardone Riviera (BS).



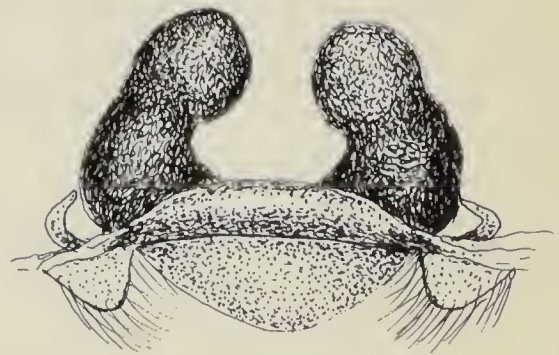
18 a



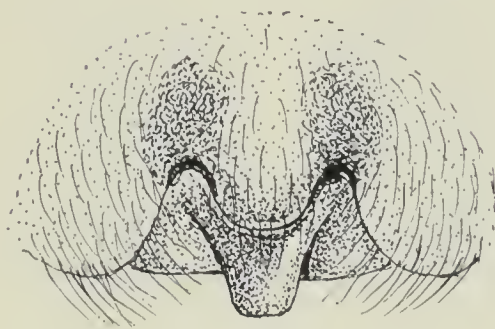
18 b



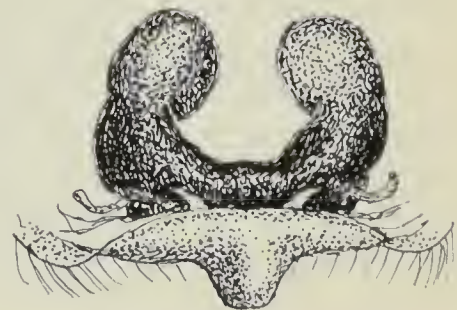
19 a



19 b



20 a



20 b

1 mm

Figs. 18-20 — Epigyne in ventral (a) and vulva in dorsal view (b) of: 18 - *Amaurobius ferox* from Somma Lombardo (VA); 19 - *Amaurobius scopolii* from Pietra Parcellara (PC); 20 - *Amaurobius pavesii* from M. Forato (MS), Paratypus.

Amaurobius scopolii Thorell, 1871

Known from many regions of continental Italy but rare on the Alps, mainly recorded as cave-dwelling species. In spite of that, no specimen among those I examined has been collected in cave.

Examined material: Liguria: M. S. Giorgio (SV), Varazze (SV), Borgio Verezzi (SV); Piedmont: Vinaldo (CN), Terme di Valdieri (CN); Emily: Pietra Parcellara (PC), Bobbio (PC), M. Penice (PC), Badagnano (PC), Parma, Corniglio (PR).

Amaurobius pavesii nov. sp.

Carapace yellowish-brown, paler at base and darkened in the cephalic region, with faint radiating striae; anterior median eyes much smaller than posterior medians. Chelicerae brownish, swollen in front. Labium and maxillae yellowish-brown, paler at apex. Sternum pale yellow, darkened at the edges. Palps and legs yellowish, with apical joints slightly darkened. Abdomen grey, with dorsal markings and ventral surface pale yellow. Posterior angles of external plate of epigyne widely rounded, outer surface of epigynal plate with median protuberance. Posterior transverse bar well developed. For other features of epigyne and vulva see figs. 20a and 20b.

Holotype ♀: Mt. Pania della Croce (Tuscany, province of Lucca), 23.-VI.1983, lg. R. Sciaky, preserved in the collections of the Museo Civico di Storia Naturale, Milan (cat. MSNM Ar 3051).

Paratypes ♀♀: Mt. Forato (Tuscany, province of Massa), 22.VI.1983, lg. Sciaky and Felegara (Emily, province of Parma), 19.III.1983, lg. M. Pavesi, both preserved in the collections of the Museo Civico di Storia Naturale, Milan (cat. MSNM Ar 3052 and Ar 64).

♂ unknown.

Measurements of the holotype (mm): carapace 4,7 long, 2,8 wide; abdomen 6,1 mm long, 4,5 mm wide; legs as follows:

	I	II	III	IV
femur	3,8	3,3	2,9	3,5
patella	1,5	1,4	1,3	1,4
tibia	3,5	2,8	2,2	3,0
metatarsus	2,9	2,5	2,0	3,9
tarsus	1,6	1,4	1,1	1,2

This species is closely related and similar in general appearance to *A. scopolii*; both are distinguished from *A. ferox* through their paler colour and the evident reduction of the anterior median eyes. *A. pavesii* is however easy to distinguish from both *A. scopolii* and *A. ferox* through epigynal characters, such as the widely rounded posterior lobes of the external plate and the narrow median protuberance of the outer surface of the epigynal plate.

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